

THE THEORETICAL ECONOMIC PRINCIPLES UNDERLYING TELRIC

By

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A. Introduction

1. In this Notice of Proposed Rulemaking (NPRM), the FCC undertakes the important task of reviewing its rules for the pricing of unbundled network elements (UNEs) and the resale of service by incumbent local exchange carriers. This review will provide the Commission with the opportunity to ensure that its rules are consistent with both sound economic principles and the primary objectives of the Telecommunications Act of 1996 (Telecommunications Act or Act). The rationale for these economic principles and the market distortions that are likely to result should the Commission's rules deviate from them is the principal objective of this discussion.

2. The task before the Commission is only slightly less daunting than the one it faced in February of 1996 when the President signed the Telecommunications Act into law. The implementation of the somewhat radical idea set forth in the Act of requiring a network owner to share its facilities with rivals under terms and conditions set by the regulatory authority is a formidable and complex undertaking. The Commission's efforts to implement this complex, multi-faceted and sometimes vague legislation have been nothing short of extraordinary. This observation notwithstanding, the prototype is rarely the best design and we have before us the opportunity to learn from seven years of experience—from the successes as well as the remaining problem areas.

3. In a different time and place almost 70 years ago, the renowned English economist John Maynard Keynes confronted the reality that accepted economic theory was not up to the task of addressing the pressing economic problems of the day. In recognizing the need for a new economic paradigm—one that required breaking with traditional modes of thought—Keynes observed that “the difficulty lies, not in the new ideas, but in escaping from the old ones. ...”² A similar challenge confronts the Commission as it undertakes a review of the “rules of engagement” that are meant to

¹ Professor of Economics, Kansas State University. The views expressed herein are exclusively my own.

² John Maynard Keynes. *The General Theory of Employment, Interest and Money*. Harcourt Brace and World, 1935, pp. viii.

promote the type of competition that Congress envisioned in passing the Telecommunications Act.³

4. The task of implementing the various provisions of the Telecommunications Act is no less daunting for state regulators, who must preside over extremely technical and arcane regulatory proceedings. The hypothetical nature of TELRIC (total element long-run incremental cost) as it has come to be applied essentially requires state regulators to evaluate the reasonableness of competing cost measures without any standards of verifiability.⁴ This task is further complicated by the same factors that attend modern day antitrust proceedings—“it is difficult to find a consultant in the new economy who is both competent and disinterested.”⁵

5. The Telecommunications Act is the first comprehensive telecommunications legislation since 1934. The preamble of the Act underscores that it was the intent of the Congress to place primary reliance on the competitive market rather than regulation to unleash the seemingly limitless potential of telecommunications technologies:

To promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.⁶

6. The principal objectives of the Telecommunications Act are best achieved by pricing rules that promote the development of efficient facilities-based competition. The Act explicitly calls for reduced regulation and increased reliance on market forces. Pricing rules that foster an uneconomic dependence on the incumbent's facilities are patently inconsistent with this outcome. The presence of facilities-based alternatives to the incumbents' networks will allow the discipline of competitive market forces to substitute for the discipline of regulation.⁷ The pricing rules for unbundled network

³ Keynes also observed that “It is astonishing what foolish things one can temporarily believe if one thinks too long alone, particularly in economics ...” *Id.* at vii. Certainly, no one that has worked on costing issues for very long, or thought about them very deeply, could possibly question the validity of this observation. And yet, before this proceeding is concluded it may become abundantly clear that some parties have spent more time thinking alone than others.

⁴ See Raymond L. Gifford, “Regulatory Impressionism: What Regulators Can and Cannot Do,” *The Review of Network Economics*, Volume 2(4) December 2003, pp. 466-479. Mr. Gifford, a past Chairman of the Colorado Public Utilities Commission, argues forcefully that implementing hypothetical TELRIC is not something that state regulators can do particularly well. In contrast, price cap regulation, unlike hypothetical TELRIC, duly recognizes the core competencies and institutional limitations of the regulatory commissions.

⁵ Richard A. Posner, “Antitrust in the New Economy,” *Antitrust Law Journal*, 68, 2001, p. 937.

⁶ Preamble, 1996 Telecommunications Act of 1996. Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.)

⁷ See *In the Matter of Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier*, 11 FCC Rcd. 3271 (1995). Policy and Rules Concerning Rates and Facilities Authorizations for Competitive Carrier

elements should be non-distortionary in the sense that they should not introduce any bias into the build or buy decision on the part of the incumbent's rivals.

7. The investment in competing facilities-based networks and new technologies envisioned by the Act is stultified by the continued availability of unbundled network elements at below-cost prices. Indeed, such policies lead to a “bad equilibrium” in which the incumbent providers do not invest because they cannot recover their costs and their rivals do not invest because it is cheaper to lease. This is not the path to a dynamic telecommunications industry, but rather to an industry characterized by atrophy and decay. Moreover, the hallmark of a competitive marketplace is that consumers enjoy greater choice in the products and services that they buy. Regulatory policies that, intentionally or otherwise, encourage entry through unbundled network elements rather than through facilities-based networks tend to promote more imitation than innovation.

8. A major challenge that confronted the Commission in 1996 and which continues to this day is that the Act does not specify a single objective, but in fact multiple objectives. This raises the possibility, if not the likelihood, of some tension between the various provisions of the statute. This tension is perhaps most clearly evident with the Act's reference to “lower prices.” Under competitive market conditions, prices will tend to move in the direction of the underlying cost of supply. It follows therefore that “lower prices” should be interpreted, and in fact can only be interpreted, in this particular context—that of a deregulatory act—to mean those prices that would be realized under truly competitive market conditions and not those prices prescribed by regulators. No other interpretation of the phrase “lower prices” is consistent with the other provisions of the statute or with the overall intent of the statute. See also paragraph 12 *infra*.

9. The Commission has specifically requested comment on an approach that bases prices for unbundled network elements “on a cost inquiry that is more firmly rooted in the real-world attributes of the existing network, rather than the speculative attributes of a purely hypothetical network.”⁸ Should the Commission ultimately adopt this approach, TELRIC measures and hence prices for unbundled network elements will presumably rise. This raises two questions. First, are lower prices for network elements necessarily good for consumers? Second, are lower prices for network elements necessarily consistent with good public policy? Both of these questions are answered in the negative.

Services (CC Docket No. 79-252), Notice of Inquiry and Proposed Rulemaking, 77 FCC 2d 308 (1979); First Report and Order, 85 FCC 2d 1 (1980); Further Notice of Proposed Rulemaking, 84 FCC 2d 445 (1981); Second Report and Order, 91 FCC 2d 59 (1982); recon.. FCC No. 83-69 (1983); Second Further Notice of Proposed Rulemaking, FCC No. 82-187(1982); Third Further Notice of Proposed Rulemaking, 48 Fed. Reg. 28,292 (1983); Third Report and Order, 48 Fed. Reg. 46,791 (1983); Fourth Report and Order, 95 FCC 2d 554 (1983); Fourth Further Notice of Proposed Rulemaking, 96 FCC 2d 922 (1984); Fifth Report and Order, 98 FCC 2d 1191 (1984); Sixth Report and Order, 99 FCC 2d 1020 (1985). *Policy and Rules Concerning the Interstate, Interexchange Marketplace, Implementation of Section 254(g) of the Communications Act of 1934, as amended*, Second Report and Order, 11 FCC Rcd 20,730 (1996).

⁸ NPRM at ¶ 4.

10. The prices for unbundled network elements should be based on the actual, forward-looking costs of the incumbent provider.⁹ Setting artificially-low prices for network elements, which is the primary objective of hypothetical TELRIC, is not good for consumers and hence not good public policy. In the longer run, this can lead only to disinvestment and ultimately to a declining industry that is victimized by the very policies that were designed to promote its vitality. This is not what the Congress intended when it stated in the preamble of the Telecommunications Act that a paramount objective of the Act is to provide “higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.” Investment in information technology is a key driver of productivity growth in the U.S. economy.^{10, 11} It would be incredibly myopic for policymakers to sacrifice investment in telecommunications infrastructure and retard the development of new telecommunications technologies in the pursuit of protectionist policies that have a dubious past and an uncertain future. As Professor Alfred Kahn has recently observed:

Subsidizing competitors at the expense of incumbents is a cheap way of getting political credit, but it is not a way of encouraging efficient competition—or, in the long run, of promoting consumer welfare.¹²

This discussion underscores the fallacy in the call by some parties for the continued availability of UNE-P so as to ensure that consumers face even lower prices for local telephone service.¹³ In point of fact, an artificially-low price is of no value to consumers if facilities-based sellers are unwilling or unable to supply the service at that price, or are

⁹ Setting the price of the network element equal to the actual incremental cost that the incumbent provider incurs in supplying the network element maximizes allocative efficiency: The valuation that society places on the last unit of consumption is equal to the resource costs borne by society in producing it. When price exceeds the actual incremental cost, consumption is curtailed that is valued more than the resource costs borne by society in producing it. Conversely, when price is less than actual cost, as would be the case with prices set on the basis of hypothetical TELRIC, consumption takes place that is valued less than the resource costs borne by society in producing it. See also ¶ 29 *infra*.

¹⁰ A study by Professor Dale Jorgenson of Harvard University reports that information technology is playing an increasingly prominent role in the growth of the U.S. economy. He estimates that information technology is responsible for adding 0.5 percentage points to the growth of total factor productivity in the U.S. over the 1995-1999 period. This compares with 0.25 percentage points over the 1990-1995 period. See Dale W. Jorgenson, “Information Technology and the U.S. Economy,” *American Economic Review*, Vol. 91, No. 1, March 2001, pp. 1-32.

¹¹ The intertemporal tradeoffs at work here must be duly recognized. State regulators can impose artificially-low prices for network elements today based on hypothetical TELRIC, but not without incurring a cost tomorrow measured in terms of reduced incentives for investment in the telecommunications infrastructure.

¹² Alfred E. Kahn, *Lessons From Deregulation: Airlines and Telecommunications After the Crunch*. Washington D.C: AEI-Brookings Joint Center For Regulatory Studies, 2004, p. 38.

¹³ Separate Statement of Commissioner Jonathan S. Adelstein, Approving in part, Concurring in Part, Dissenting in Part. Federal Communications Commission, Triennial Review Order, August 21, 2003, p. 2.

unwilling or unable to make the capital investments that render the supply of the service possible.¹⁴

11. The aforementioned observations necessarily raise the question as to the proper role of the Commission in overseeing the implementation of the Telecommunications Act. Given that the Act is a deregulatory statute, the Commission's charge is first and foremost one of setting the "rules of engagement" for the competitive free-for-all that the Act envisioned. The Commission has from time-to-time (the Triennial Review Order being the most recent occurrence) taken counsel from the antitrust literature to inform its policy positions and direction. Under the antitrust laws, the role of the government is to referee the struggle between competing interests while, in turn, recognizing that the "referee's role must be appropriately circumscribed."¹⁵ The antitrust laws do not serve to protect individual competitors, but rather to protect the integrity of the competitive process and promote economic efficiency.¹⁶

12. Protecting the integrity of the competitive process means that the government does not preordain marketplace outcomes. This is where I believe the Commission's prevailing conception of TELRIC may have crossed the line. Previously, I observed that the Commission's implementation of the Act—the hypothetical "efficient-firm" standard underlying TELRIC, in particular—"confuses mandating the competitive outcome with fostering the competitive process."^{17, 18} In other words, if the outcome of the competitive process could be known in advance, it would, of course, be totally unnecessary:

If regulators were in fact all-knowing, there would be no need for competition. The regulator could simply direct the incumbent firm to

¹⁴ That at least some incumbent local exchange carriers are purportedly cutting back on their capital expenditures is potentially a cause for concern. See, for example, Federal Communications Commission, CC Docket No. 01-338, Review of Section 251: Unbundling Obligations of Incumbent Local Exchange Carriers, SBC Communications Inc., Memorandum of *Ex Parte* Presentation, September 10, 2002.

¹⁵ Joel I. Klein, "The Importance of Antitrust Enforcement In The New Economy." Before the New York State Bar Association, Antitrust Law Section Program, New York, NY, January 29, 1998, p. 12.

¹⁶ Richard A. Posner, *Antitrust Law*. Chicago: University of Chicago Press, 2001.

¹⁷ Dennis L. Weisman, "The (In)Efficiency of the 'Efficient-Firm' Cost Standard." *The Antitrust Bulletin*, Vol. XLV(1), Spring 2000, p. 197.

¹⁸ A thought-provoking discussion and historical account of this important distinction is P. J. McNulty, *Economic Theory and the Meaning of Competition*. *Quarterly Journal of Economics*, Vol. LXXXII, 1968, pp. 639-656. In a particularly prophetic passage, McNulty (p. 649) observes that with respect to the classical school:

their concept of competition was a disequilibrium one of market activity, . . . Perfect competition, on the other hand, is an equilibrium situation in which price becomes a parameter from the standpoint of the individual firm and no market activity is possible. Thus the classical concept of competition as a guiding force, to which we earlier referred, is not only different from that of the neoclassical concept of competition as a state of affairs; the two are incompatible in a fundamental sense, reflecting precisely the difference between a condition of equilibrium and the behavioral pattern leading to it.

produce in accordance with the efficient-firm standard. The reality, of course, is that regulators do not have sufficient information to actively engage this approach.¹⁹

Professor Alfred Kahn makes a similar point with the following observation:

The Commission has in effect declared: *We* will determine not what your costs are or will be but what we think they *ought to be*. Why should we bother to let the messy and uncertain competitive process determine the outcome when we can determine at the very outset what those results would be and prescribe them now?²⁰

13. The Commission itself appears to recognize that its prevailing approach to TELRIC may have crossed the line between protecting individual competitors and protecting the integrity of the competitive process:

Our concerns in evaluating the TELRIC pricing rules are somewhat different than those present at the time the Commission adopted its *Local Competition Order*. At that time, local competition was largely a theoretical exercise and we placed a premium on the need to stimulate entry into the local exchange market.²¹

To the extent that the application of our TELRIC pricing rules distorts our intended pricing signals by understating forward-looking costs, it can thwart one of the central purposes of the Act: the promotion of facilities-based competition.²²

14. There are three costing standards that have been put forth as a basis for pricing unbundled network elements: (i) embedded/historical costs; (ii) actual, forward-looking costs; and (iii) “efficient-firm,” forward-looking costs or, what I shall refer to here as hypothetical TELRIC.²³ I have been consistent throughout my writings in my criticisms of hypothetical TELRIC, but certainly no less critical of the claims by some incumbent providers that they are *necessarily* entitled to the recovery of their

¹⁹ Weisman, *supra* note 17, p. 210.

²⁰ Alfred E. Kahn, *Letting go: Deregulating The Process of Deregulation*. Michigan State University Press, 1998, p. 92.

²¹ NPRM at § 2.

²² NPRM at § 3.

²³ In its reply brief before the U.S. Supreme Court in *Verizon v. FCC*, the Commission intimates that there are not two different measures of forward looking costs, but, in fact only one, that of the incumbent local exchange carrier. See Federal Communications Commission Reply Brief in *Verizon et al v. FCC et al*. Case No. 00511, July 2001, pp. 2, 4, and 6. And yet, in this NPRM at ¶ 4, the Commission contemplates a measure of TELRIC that is “more firmly rooted in the real-world attributes of the existing network, rather than the speculative attributes of a purely hypothetical network.”

embedded/historical costs.^{24, 25} I believe that the Commission has come to realize that a hypothetical TELRIC measure is fraught with problems and may prove detrimental to the realization of the goals of the Act. This realization opens the door for a meaningful discussion of the economic principles that should guide the measurement of TELRIC. This is the subject of the following section.

B. Economic Principles

15. Principle 1. TELRIC should not distort the “build or buy” decision of rivals in determining their respective entry strategies in the local telephone service market. The Commission acknowledges in paragraphs 2 and 3 of the NPRM (reproduced above) that the objectives of TELRIC today may be somewhat different than the objectives of TELRIC when it adopted the *Local Competition Order*. In other words, policies designed to jump-start competition in order to promote entry in the market may not be entirely consistent with the reduced regulation and increased reliance on market forces that the Act envisioned.

16. The Commission’s introspection into these issues is both laudable and timely, particularly in light of the history of asymmetric regulation in the telecommunications industry and long-standing concerns as to the wisdom of such policies. To wit, in overseeing the transition to competition in the long-distance market, the Commission adopted a policy of competitive handicapping in which the incumbent firm (AT&T) was severely constrained in battling with its competitors in the marketplace.²⁶ Whether such policies had merit in the early stages of competition in the long distance market is open to debate.²⁷ That such policies remained in place too long, that they allowed rivals to develop an unhealthy dependence on the regulatory process for

²⁴ Dennis L. Weisman, “Did The High Court Reach An Economic Low in *Verizon v. FCC*?” *The Review of Network Economics*, Vol. 1(2), September 2002, pp. 90-105; Dennis L. Weisman, “Is There ‘Hope’ For Price Cap Regulation.” *Information Economics and Policy*, Vol. 14(3), September 2002, pp. 349-370; and Dale E. Lehman and Dennis L. Weisman, *The Telecommunications Act of 1996: The “Costs” of Managed Competition*. Boston: Kluwer, 2000, chapter 7.

²⁵ The use of the term *necessarily* in this statement is by design. I have been critical of the idea that a regulator should be allowed on the one hand to commit to a price cap regime and then, on the other hand, essentially breach that commitment by setting artificially-low prices for unbundled network elements. I do not believe that a regulated firm should be protected from the “natural play” of market forces, nor do I believe that it should be victimized by blatant regulatory opportunism. *Id.* See note 79 *infra*.

²⁶ See, for example, Alfred E. Kahn, “The Uneasy Marriage of Regulation and Competition.” *Teleomatics*, Vol. 1, Number 5, pp. 1-17; Dennis L. Weisman, “Asymmetrical Regulation.” *Telecommunications Policy*, Vol. 18(7), October 1994, pp. 499-505; and John R. Haring, “Implications of Asymmetric Regulation for Competition Policy Analysis. Working Paper 14, Office of Plans and Policy, Federal Communications Commission, 1984.

²⁷ See David E. M. Sappington and Dennis L. Weisman. *Designing Incentive Regulation For The Telecommunications Industry*. Cambridge MA.: MIT Press and Washington D.C.: AEI Press, 1996, chapter 8.

their very survival,²⁸ that they pegged prices at artificially high levels and that they may ultimately have served to harm rather than help consumers, is perhaps less so.²⁹

17. The economic principle that TELRIC should be neutral with respect to the rivals' "build or buy" decision should perhaps be tempered somewhat in light of the Commission's recognition of the fact that "the promotion of facilities-based competition" is "one of the central purposes of the Act."³⁰ This may suggest that if there are to be departures from the "competitive neutrality" of TELRIC, those departures should serve to encourage rather than discourage facilities-based competition. While this observation does not necessarily imply that TELRIC should be set artificially high, it certainly does require that TELRIC not be set artificially low. The reference to "artificially low" in this context refers specifically to forward-looking costs below the incumbent's actual forward-looking costs. The incumbent's actual forward-looking costs are those to which rivals should set their sights.

18. The proper incentives for efficient investment in network infrastructure is critical to realizing the goals of the Telecommunications Act. Artificially high TELRIC measures could be expected to result in over-investment in facilities-based networks. And yet artificially-low TELRIC measures are perhaps even more pernicious. They give rise to a "bad equilibrium" in which the incumbents do not invest because they cannot recover their costs and their rivals do not invest because it is cheaper to lease. In a world in which everyone is free-riding, just who is supposed to build the car?³¹

19. The above discussion leads naturally into the question of the correct cost measure to use for computing TELRIC. The Commission raises this very question:

Does our tentative conclusion (that UNE prices be based on a "cost inquiry more firmly rooted in the real-world attributes of the existing network"³²) compel us to shift from a long-run average cost methodology to a short-run average cost methodology? If so, what are the consequences of such a shift? To the extent that the cost of a UNE under such an approach would in part be based on the existing incumbent LEC network, is such an approach consistent with the "heavy presumption" against the use of embedded costs? Would it be more effective to retain a long-run pricing methodology, but provide

²⁸ See, for example, John R. Haring, "The FCC, The OCCs, and the Exploitation of Affection." Federal Communications Commission, Office of Plans and Policy, Working Paper 17, 1985.

²⁹ See, for example, Mark S. Fowler, Albert Halprin and James D. Schlichting, "'Back to the Future': A Model for Telecommunications." *Federal Communications Law Journal*, 1986, Volume 38, Number 2, pp. 145-200.

³⁰ NPRM at ¶ 3.

³¹ Alfred E. Kahn, Timothy J. Tardiff and Dennis L. Weisman, "The 1996 Telecommunications Act At Three Years: An Economic Evaluation of Its Implementation By The FCC." *Information Economics and Policy*, Vol. 11(4), December 1999, pp. 346-350.

³² NPRM at ¶ 4.

specific guidance to the states on the appropriate long-run assumptions upon which to base network inputs?³³

The answers to the important questions posed by the Commission in this paragraph serve, not only to highlight the relevant economic principles that should be accorded significant weight in their deliberations, but also provide the opportunity to delineate the key relationships between these various cost measures and their role in the proper measurement of TELRIC.

20. Principle 2. The default costing standard for the proper measurement of TELRIC is a long-run, forward-looking cost standard that reflects the actual network characteristics of the (“presumptively efficient”) incumbent provider.^{34, 35} This costing standard contrasts, in some cases starkly, with the hypothetical TELRIC measure that some have interpreted the *Local Competition Order* to permit or require. It is unclear (even after numerous readings) whether, in singling out the assumption that wire centers remain fixed,³⁶ the Commission was necessarily implying that TELRIC be measured with respect to an ideally “efficient firm” standard in all other respects.³⁷ Nonetheless, even the most permissive reading of the Commission’s *Local Competition Order* cannot validate the hypothetical TELRIC standard that some have found to their liking. It is instructive to reproduce here the exact wording that the Commission used in its *Local Competition Order* to describe its costing standard:

Under the third approach, prices for interconnection and access to unbundled network elements would be developed from a forward-looking economic cost methodology based on *the most efficient technology deployed in the incumbent LEC’s current wire center locations*. This approach mitigates incumbent LECs’ concerns that a forward-looking pricing methodology ignores existing network design, while basing prices on efficient, new technology that is compatible with the existing infrastructure. *This benchmark of forward-looking cost and existing network design most closely represents the incremental*

³³ NPRM at ¶ 55.

³⁴ The term “default” in this context means that the proper standard should be a long-run, forward-looking cost methodology that reflects the actual network characteristics of the incumbent provider—absent credible marketplace evidence to suggest that an efficient incumbent provider operates otherwise.

³⁵ While this distinction between long run and short run costs is standard in economics, not all economists find this distinction particularly useful when examining changes in cost over time. See, for example, Stephen Littlechild, *Elements of Telecommunications Economics*. Peter Peregrinus LTD., 1979, pp. 71-72; and Alfred E. Kahn., *The Economics of Regulation*. New York: Wiley, 1971, p. 72, note 21.

³⁶ Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket 96-98, First Report and Order, FCC 96-325, Released August 8, 1996, ¶ 685.

³⁷ In my earlier writings, I had characterized the connection as follows: The FCC’s Interconnection Order describes the approach to calculating TELRIC (Total Element Long-Run Incremental Cost) as making use of the “most efficient technology available.” If the FCC’s approach and the efficient-firm standard are not identical, they are kindred spirits. Weisman *supra* note 17, pp. 198-99.

costs that incumbents actually expect to incur in making network elements available to new entrants.³⁸ (emphasis added).

21. Three observations about the above paragraph are noteworthy. First, the reference is to the “most efficient technology deployed in the incumbent LEC’s current wire center locations.” This encompasses more than merely the locations of the incumbent LEC’s wire centers. Second, in its reply brief before the U.S. Supreme Court in *Verizon v. FCC*, the Commission’s counsel replaced the above phrase “most efficient technology deployed” with “most efficient technology available on the market.”³⁹ This distinction is potentially important because any technology can be placed on the market (or alleged to be “theoretically feasible”), but a technology that has actually been deployed on a scope and scale comparable to that experienced by an ILEC presumably passes some further test of validity. Third, the Commission’s intent was clearly for TELRIC to provide the best possible approximation of the “incremental costs that incumbents actually expect to incur.”⁴⁰ In other words, TELRIC should represent the long-run, forward-looking cost of an incumbent provider, absent any demonstrable inefficiencies.⁴¹ This paragraph does not allow for unbridled discretion to implement TELRIC in a manner that reflects a degree of instantaneous productivity growth that has no rational connection to actual network characteristics and current operating practices.^{42, 43}

In contrast with the two to three percent annual cost reductions contained in price cap plans—which purport, at least, to be based on historical experience of productivity improvements actually achieved and therefore presumed to be achievable—the results of these models implicitly assume that an efficient local exchange carrier could operate up to *twice* as efficiently as—that is, at costs *one half* those of—the incumbent. Price reductions that would take

³⁸ *Local Competition Order*, *supra* note 36 at ¶ 685.

³⁹ Federal Communications Commission Reply Brief in *Verizon et al v. FCC et al*. Case No. 00511, July 2001, p. 2 (emphasis added).

⁴⁰ The Commission recently confirmed this interpretation when it stated in its brief before the U.S. Supreme Court that TELRIC provides “the best approximation of an incumbent’s forward-looking cost of providing network elements to itself and others.” *Id.* p. 4.

⁴¹ If the incumbent provider is as efficient as it knows how to be, and the regulator has no credible evidence to the contrary, any attempt to further ratchet down costs in the pursuit of some ideal level of efficiency is, by definition, arbitrary and capricious.

⁴² The available evidence suggests that the average UNE rate for local loops set by state commissions was initially around \$5 per month lower than embedded cost. With an average state X factor of 2.5 percent, it would take at least 28 years to achieve the cost reductions embodied in the UNE rates set by the states. Dale E. Lehman, “The Court’s Divide.” *The Review of Network Economics*, Vol. 1(2), September 2002, p. 108.

⁴³ Data from a recent arbitration proceeding reveals that the incumbent provider’s forward-looking cost estimate for local loops was \$22, whereas the corresponding CLEC estimate was \$6.50. See Timothy J. Tardiff, “Pricing Unbundled Network Elements and the FCC’s TELRIC Rule: Economic and Modeling Issues.” *Review of Network Economics*, Vol. 1(2), September 2002, pp. 139.

over 20 years to be effectuated under price caps are assumed by these models to be achievable instantaneously ...⁴⁴ (footnote omitted).

22. The Commission explicitly raises in the NPRM the possibility of adopting a short-run costing methodology. A short-run average cost methodology is inappropriate on multiple grounds. First, it would send incorrect signals to would-be entrants concerning their “build or buy” decisions.⁴⁵ Second, in industries with a high proportion of fixed and sunk costs, a short-run cost standard would precipitate an unacceptable level of volatility in the pricing of network elements.⁴⁶ Third, it would enable rivals to leverage the incumbent provider’s obligation to build ahead of demand to remain in compliance with its duty to serve as the carrier-of-last resort in its service territory. Fourth, whereas pricing on the basis of short-run marginal cost may be appropriate to utilize existing network capacity most efficiently,⁴⁷ it cannot and should not serve as a basis for pricing network elements to implement a statute that has as a primary objective to promote investment in facilities-based networks. To wit, how many planes would Boeing sell if regulators required commercial airlines to price all seats at standby fares? The answer, most assuredly, is not very many.

23. The relationship between investment incentives and TELRIC is critical and serves as a benchmark to evaluate the reasonableness of the assumptions underlying the TELRIC methodology. It is important to recognize that no new entrant would rationally invest in network equipment if they could purchase network equipment with the same functionality at short-run marginal cost. Similarly, no incumbent provider would rationally upgrade or replace its network if it had to price on the basis of short-run marginal cost for an indefinite period of time. Of course, hypothetical TELRIC suffers from the very same defect. It should be stressed that such measures may be no less

⁴⁴ Kahn et. al., *supra* note 31, pp. 331-332.

⁴⁵ As a theoretical matter, short-run marginal cost may be either greater than or less than long-run marginal cost. See Kahn *supra* note 35, chapter 3; and Alfred E. Kahn and William B. Shew, “Current Issues in Telecommunications Regulation: Pricing,” *Yale Journal on Regulation*, Vol. 4, 1987, pp. 191-256. Short-run marginal costs do not include capacity costs, but they are not necessarily inconsistent with the recovery of capital costs. For our purposes here, we assume that the incumbent provider is operating with excess capacity so that short-run marginal cost is lower than long-run marginal cost and hence prices set equal to short-run marginal cost would not enable the incumbent provider to recover its capital costs.

⁴⁶ In addition, while capital costs are not included in the short run marginal cost measure, the short-run marginal cost measure should account for the fact that an increase in demand will accelerate the point in time at which the firm will have to make new investments. See Kahn *supra* note 35, pp. 71-72.

⁴⁷ Professor J. M. Clark provides an early, insightful discussion of this issue:

Since it appears not only natural but desirable that a company should carry, a large part of the time, capacity beyond the demands of the business of the moment, it seems to follow that it should be free to minimize the burden of unearned overhead costs by making low rates to develop additional business which may utilize this capacity, with the understanding that this creates no permanent obligation and that these rates may be raised when regular business expands to the point of requiring the full capacity of the plant. Such rates would be difficult to administer, but are justified, at least in theory, by the facts of the case.

J. Maurice Clark, *Studies in the Economics of Overhead Costs*. Chicago: University of Chicago Press, 1923, p. 332. See also Kahn et. al. *supra* note 31, pp. 341-342.

destructive than short run costs in undermining investment incentives for both incumbent providers and rivals alike.

Just as in rate-cap regulation, competitive markets set prices on the basis (roughly speaking) of the costs of incumbents. Those prices give challengers the proper target at which to shoot—the proper standard to meet or beat and the proper reward if they succeed. If they can achieve costs lower than that, firms will enter and in the process beat prices down to efficient levels. The FCC’s choice, of—omnisciently—prescribing at once what it thinks would be the *outcome* of such a process, *short-circuits* it: why would competitors undertake the risks of major investments in their own facilities if they can lease them from the incumbent firms at what regulators speculate would be the minimum costs than an ideally efficient firm would incur constructing them afresh?⁴⁸

24. Professor Kahn’s concerns reflect what we may term the economic counterpart to the *Heisenberg Uncertainty Principle* in Physics. Just as it is not possible to separate the observer from the results of the experiment being observed,⁴⁹ it is not possible to separate the regulator from the market’s competitive transition. This observation notwithstanding, the Commission should reevaluate its rules for TELRIC from the perspective that the Act calls for accommodating new entrants rather than subsidizing them, and this is a distinction with an important difference. In implementing the Telecommunications Act, this Commission, much like the *Starship Enterprise*, has boldly gone where no one has gone before. Moreover, in crafting competition policies designed to “reduce regulation” and place increased reliance on market forces, this Commission should embrace the very same *prime directive* that so ably guided the crew of the *Enterprise*—that of non-interference.

25. In order to fully understand the rationale for *Principle 2*, it is necessary to reconcile the use of a long-run costing standard with the following two statements: (1) The proper TELRIC measure should reflect the actual costs the incumbent provider incurs in supplying the specified increment of unbundled network elements; and (2) At any given point in time some portion of the costs associated with supplying the specified increment of unbundled network elements are likely to be sunk and hence unavoidable.⁵⁰

⁴⁸ Alfred E. Kahn, *Whom the Gods Would Destroy, or How Not to Deregulate*. AEI-Brookings Joint Center For Regulatory Studies, Washington D.C., 2001, pp. 6-7.

⁴⁹ This is one interpretation of the Heisenberg Uncertainty Principle (sometimes known as the indeterminacy principle). See Stephen W. Hawking. *A Brief History of Time*. Toronto: Bantam Books, 1988, Chapter 4.

⁵⁰ Costs do not become sunk as a function of time, but as a function of business decisions, each of which has a particular time horizon associated with it. The typical business firm continually finds itself in a state of the world in which it is free to vary the levels of some inputs, but not all inputs. Time mainly serves as an index to chart the effects of past business decisions in rendering costs either avoidable or unavoidable. See Dennis L. Weisman, “How Cost Allocation Systems Can Lead Managers Astray.” *Journal of Cost Management*, Vol. 5(1), Spring 1991, pp. 4-10. Professor Kahn also makes the salient observation that

These statements are reconciled with the observation that in the absence of a *regulatory contract*—the historical bargain between the regulated firm and the regulator to balance the obligation to serve with the obligation to be served—regulated firms would naturally enter into long term contracts with end-use customers to minimize demand uncertainty and the risks associated with the recovery of capital costs.⁵¹ In other words, if capital is not invested until the long-term contract is signed, then the purchaser is causally responsible for the capital costs being incurred, and hence the long-run cost measure is the efficient costing standard. By similar reasoning, in the case of on-demand or spot market sales, the buyer may bear no direct causal responsibility for the capital costs being deployed and the short-run cost measure is the efficient costing standard. The implication then is that the structure of the sales transaction (on-demand vs. long-term contract) between buyer and seller determines the relevant measure of incremental cost.⁵² The outstanding question then concerns the structure of the sales transaction implied by the provisions of the Telecommunications Act.

26. The Telecommunications Act at its core is a governmental obligation imposed on the incumbent providers to supply network elements to rivals. The government serves as a *de facto* agent for the rivals of the incumbent provider under the Telecommunications Act, much as it previously served as an agent for end-use customers under the traditional *regulatory contract*. This obligation imposed on the incumbent providers is causally-responsible for their provisioning network elements and the capital investments that supplying such elements necessarily entails. The implication then is that the long-run, forward-looking cost measure is the efficient costing standard for the pricing of network elements.

27. In industries with a high proportion of fixed and sunk costs, such as telecommunications, the short-run marginal cost measure gives rise to a paradox in which the more intensively it is relied upon for the pricing of goods and services the less relevant it may become. To wit, a firm that is forced to sell its products and services in a competitive marketplace at a price equal to short-run marginal cost over a prolonged period of time, either because of regulatory fiat or adverse market conditions, will either fail to survive or will change the terms of the sales transaction between buyer and seller from on-demand to long-term contract. This suggests that the relevance of the short-run

“most firms carry with them into new investment decisions the consequences of investment decisions made in the past.” Kahn, *supra* note 35, p. 124, note 3.

⁵¹ See, for example, Victor P. Goldberg, “Regulation and Administered Contracts.” *The Bell Journal of Economics and Management Science*, 1976, Volume 7, pp. 426-447; and Dennis L. Weisman, “Optimal Re-contracting, Market Risk And The Regulated Firm In Competitive Transition.” *Research in Law and Economics*, Vol. 12, 1989, pp. 153-172. The main argument here is that, at least historically, that is, pre-competition, the regulated firm’s obligation to serve was symmetrically balanced with the customers’ obligation to be served, with the regulator simultaneously serving as the agent for the consumer and the principal for the regulated firm. In this regard, regulation explicitly controlled entry to foster rate design policies that would not be sustainable in a competitive marketplace. See, for example, Richard A. Posner, “Taxation by Regulation.” *The Bell Journal of Economics*, Vol. 2, 1971, pp. 22-50.

⁵² See, for example, Dennis L. Weisman, “A Note on First-Best Marginal Cost Measures in Public Enterprise.” *Energy Economics* 13 (4), 1991, pp. 250-253.

marginal cost measure, in terms of the level at which prices should be set, may be somewhat limited in practice for an ongoing business concern.

28. A natural question that follows from the above discussion concerns the possibility of a price squeeze if the incumbent provider sells network inputs to rivals at prices based on a long-run, forward-looking cost standard, but is allowed to price down to short-run marginal cost when selling services to retail customers. Closer inspection reveals that there is no anticompetitive concern. The following passage is instructive:

In contrast, there is no difference in principle between the incumbent provider incurring the sunk costs of serving an anticipated level of demand and a non-facilities-based competitor committing in advance to lease from it the requisite network elements under long-term contract. In both cases, the relevant measure of incremental cost at the time of the retail sale could be below, perhaps significantly below, LRIC: the capacity costs are sunk. In these circumstances, the respective risks are symmetrical and the permissible ranges of retail pricing flexibility for the several competitors ought to be comparable.⁵³

29. Principle 3. Costs must have objective reality in the sense that TELRIC measures should comport with the facts on the ground. Efficiency in the pricing of network elements requires that TELRIC reflect the costs actually caused by supplying network elements to rivals—or, similarly, those costs that could be avoided if those network elements were not supplied.⁵⁴ This necessarily implies that the competitive process is subverted by the use of hypothetical TELRIC. As Professor Alfred Kahn explains:

In unregulated markets, prices tend to be set on the basis of the actual costs of incumbent firms, and they should be. The economic purpose of prices set at incremental cost is to inform buyers—and make them pay—the cost that society will *actually* incur if they purchase more or would *actually* save if they reduced their purchases, entirely or partially. These can only be the costs of the supplier whose prices are being set, not some hypothetical ideal producer.⁵⁵ [emphasis in original]

⁵³ Kahn et al., *supra* note 31, p. 342.

⁵⁴ Kahn, *supra* note 48, p. 4 observes that:

The entire logic of the marginal cost pricing principle requires that prices reflect the additional costs that society will actually incur or save if purchasers take somewhat more or somewhat less of the product or service in question. Prices set intentionally below that level by FCC decree, on the ground that the actual incremental costs of the ILECs doubtless reflect inefficiencies, clearly defeat that purpose; they induce buyers to demand (incremental) quantities of the services in question, the value of which to them is less than the (incremental) costs that society actually occurs in providing them. (footnote omitted)

⁵⁵ Kahn, *supra* note 20, p. 96.

30. As discussed previously, the Commission has from time-to-time, most recently in its Triennial Review Order, sought counsel in the antitrust and law and economics literature to inform its deliberations and ensure that its rulings had foundation in accepted economic and legal doctrine. In this very context, I previously observed that: “In the law and economics literature, ‘costs’ have traditionally referred to those costs that the firm actually incurred or expected to incur in supplying a product or service—unless demonstrably imprudently incurred—and not simply by reference to some ‘blank-slate’ estimate of what costs should have been.”⁵⁶ In other words, costs cannot be whatever some party with a vested interest imagines them to be—they must have objective reality.⁵⁷ Could it meaningfully be otherwise?

31. In its briefs before the U.S. Supreme Court in *Verizon v. FCC*, the Commission observed, correctly, I believe, that any forward-looking cost study involves some degree of speculation:

Any forward-looking cost study is necessarily predictive, and thus “hypothetical,” to the extent that it must, for example, establish appropriate depreciation rates and costs of capital. ... But the fact that a rate methodology involves predictive judgments does not render it economically untenable.⁵⁸

What renders a rate methodology or costing standard untenable is not the use of predictive judgment *per se*, but rather the use of predictive judgment that has little or no foundation in reality, or cannot be validated or verified. Differences in degree can shade into differences in kind when predictive judgment degenerates into wild speculation. Predicting how fast an Olympic sprinter will cover one-hundred meters in the next race on the basis of his performance in the last ten races is predictive judgment; predicting that this very same sprinter could cut his best time in half in the next one-hundred meter race if only he wore new shoes is wild speculation.

32. It is, of course, common practice among economists to build mathematical models to gain some insight into the workings of a particular economic phenomenon. Models that attempt to account for each and every nuance of the real world are generally

⁵⁶ Weisman, *supra* note 24, “Did The High Court Reach An Economic Low in *Verizon v. FCC*?,” p. 96.

⁵⁷ Recent events attest to the financial market upheavals that can result when firms are free to hypothesize as to what their revenues and earnings might be in a state of the world in which they are considerably more efficient and ingenious than they are today. This begs the question as to whether it is any less unwise for policymakers to condone, if not actively encourage, similar displays of undisciplined behavior in the costing standards used to set the prices for unbundled network elements? In fact, an outstanding question concerns to what extent the Commission’s pricing policies for unbundled network elements coupled with the ambiguity of the Telecommunications Act itself may have contributed to the severity of the recent financial volatility in the telecommunications sector. See, for example, Kahn *supra* note 11, pp. 26-41; and Elise A. Cooper, John P. Hejkal and Alexander L. Wolman, “Boom and Bust in Telecommunications.” Federal Reserve Bank of Richmond, *Economic Quarterly*, Volume 89/4, Fall 2003, pp. 1-24.

⁵⁸ Federal Communications Reply Brief in *Verizon et al v. FCC et al*. Case No. 00511, July 2001, p. 6, note 3.

intractable and therefore of little value. Similarly, models that disavow key aspects of the real world are also of little or no value because, while such models may be tractable, their predictions are largely meaningless. Hence, the economic modeling underlying TELRIC should attempt to strike the appropriate balance—capture enough of the real world phenomena to make the predictions from the modeling exercise reasonably accurate, but not so much of the extraneous detail that the model becomes intractable. This necessarily requires that the modeling exercise take into proper account the actual topography where the network is deployed (including bodies of water, mountains, etc.). The modeling exercise should also recognize that incumbent providers have strong incentives to manage their networks with the utmost efficiency and business acumen. This latter observation implies that the current operating costs of the incumbent provider are a reasonable starting point for the analysis. It follows that there is little value in using mathematical algorithms to simulate a “hypothetical planet” that assumes: (1) a topography most conducive to network deployment and cable routing at the lowest theoretically possible cost; and (2) that operating costs tomorrow are only a fraction of what efficient incumbent providers incur today.

33. The discussion above raises the question of the proper role of “history” in making prudent, predictive judgments as to the costs that are reasonably achievable by an efficient, incumbent provider. The fact that embedded/historical costs are not used to set actual rates for unbundled network elements does not imply that such cost measures do not contain potentially useful information in evaluating the reasonableness of TELRIC measures. For example, suppose that an incumbent provider has been operating under pure price cap regulation over a prolonged period of time.⁵⁹ A pronounced difference between the current, actual cost of provisioning a loop and the corresponding hypothetical TELRIC measure may allow for a reasonable inference to be drawn that the TELRIC methodology or calculation is suspect. The institutional history is important here; just as we expected the Olympic sprinter to run as fast as he was able in past races, we expect the firm under pure price cap regulation to be as efficient as it knows how to be.⁶⁰ Moreover, even the Olympic sprinter that runs flat out in every race knows that his times will likely be better when his competition is stiffest. This is the fundamental failing of hypothetical TELRIC—it assumes that we can determine the “fastest sprinter” without actually running the race.

34. The fact that the rivals of the incumbent providers’ are among the most vocal proponents of hypothetical TELRIC (and artificially low prices for unbundled network elements) may not be a positive signal for investment in facilities-based networks. If these rivals were actually planning to invest in their own facilities-based networks, it would seem that their optimal strategy would be to peg the incumbent

⁵⁹ Pure price cap regulation means that there is no *ex post* sharing of earnings with consumers. Except where otherwise noted, the terms price cap regulation and pure price cap regulation are used interchangeably.

⁶⁰ For further elaboration on the idea that regulated firms may be as efficient as they know how to be, see Dennis L. Weisman and Johannes P. Pfeiffenberger, “Efficiency as a Discovery Process: Why Enhanced Incentives Outperform Regulatory Mandates.” *The Electricity Journal*, Vol. 16(1), January/February 2003, pp. 55-62.

provider's costs at the highest (rather than the lowest) possible level. Notably, in markets in which rivals compete head-to-head with the incumbent provider using their own facilities, their intervention in regulatory proceedings has typically focused on raising the costs of the incumbent provider rather than lowering them.⁶¹ This "signal" is not perfect, however, because even facilities-based providers are likely to use some unbundled network elements to provide for the requisite degree of ubiquity on their networks.

35. The proposition that TELRIC should reflect the costs that the incumbent provider actually incurs in provisioning network elements to rivals necessarily implies that the cost-of-capital duly accounts for the risks that the incumbent provider bears. For example, there has been protracted debate as to whether a cost-of-capital that reflects competitive market conditions is appropriate. In fact, a cost-of-capital that is characteristic of competitive market conditions may well understate the risks borne by the incumbent providers under the unique obligations imposed upon them by the provisions of the Telecommunications Act. The incumbent providers find themselves in an increasingly competitive marketplace in which (1) they must share their networks with rivals at costs that reflect productivity gains that no real-world provider has ever come close to achieving; (2) they must continually update their technologies and operating practices; (3) they face severe financial penalties if their operations and support systems fail to process orders in compliance with the strict parity requirements that regulators have put in place; (4) they are subject to asymmetric regulation for both retail prices and quality at the state level which further constrains their ability to mount a rapid competitive response to rivals; (5) they face asymmetrical risks—the privilege of selling a successful new service at TSLRIC and the *de facto* disallowance of costs should the new service prove unsuccessful; and (6) their investments in network infrastructure are irreversible. Professor Jerry Hausman explains this last point in terms of rivals being provided with a "free option":

The ILEC could offer the new competitor a contract for the economic life of the investment—say ten years for investment in the local loop. The price of the unbundled network element would be the total investment cost plus the operating costs each year for the unbundled element. If demand did not materialize or prices fell, the new entrant would bear the economic risk of this outcome. However, regulation by total-service long-run incremental cost (TSLRIC) typically allows the new entrant to buy the use of the unbundled network element on a month-by-month basis. *Thus, if demand does not materialize or prices fall, the ILEC must bear the risk for the business case of the new competitor.* Thus, the ILEC has been required by regulation to give a free option to the new entrant, where an option is the right, but not the obligation, to purchase the use of the unbundled network elements. The monthly price of the unbundled network element should be significantly higher than the ten-year price of the element to reflect the risk inherent in the sunk investments, or equivalently, the value of the option given to the new

⁶¹ See, for example, Dennis L. Weisman, "The Law and Economics of Price Floors in Regulated Industries." *The Antitrust Bulletin*, Vol. XLVII(1), Spring 2002, pp. 107-131.

entrant. Regulators to date have not incorporated the value of the option, which arises from the sunk cost nature of much telecommunications investment, into their price setting.⁶² [emphasis added]

36. It is noteworthy that in the pre-competition era, regulators mitigated the risk associated with the sunk cost nature of telecommunications investments by balancing the utilities' obligation to serve with the customers' obligation to be served. In this environment, the customers' options were explicitly limited by the *regulatory contract* between the regulator and the utility.⁶³ This reduced demand uncertainty and provided reasonable assurances of cost recovery. In the current environment, the incumbent provider's obligation to serve is no longer balanced against an obligation to be served by either retail customers or the incumbent provider's rivals. This asymmetry simultaneously and artificially raises the actual costs of the incumbent provider and lowers the costs of the rivals. In other words, it violates the *principle of competitive neutrality* because it distorts efficient marketplace outcomes. The solution is to allow for the prices of network elements to reflect the true risk-adjusted TELRIC measure. This necessarily implies that efficient prices for network elements should reflect any differences in risk-bearing that may arise according to whether network elements are sold to rivals "on demand" or under long-term contract.⁶⁴ Indeed, a failure to reflect such differences in risk in the prices for network elements will distort the rivals "build or buy" decision.

37. Principle 4. Pure price cap regulation (relative to traditional, rate-of-return regulation) provides the incumbent provider with incentives for efficiency that more closely approximate those of a competitive marketplace.⁶⁵ The institutional history

⁶² Jerry Hausman, "The Effect of Sunk Costs in Telecommunications Regulation," in *The New Investment Theory of Real Options and its Implications for Telecommunications Economics*, ed. by James Alleman and Eli Noam. Boston: Kluwer Academic Publishers, 1999, p. 193.

⁶³ See the discussion and supporting references in note 51 *supra*.

⁶⁴ A recent book chapter examines this issue from the perspective of leasing versus buying a computer:

Taking this phenomenon into account in setting prices for network elements would be analogous to the fact that leasing a computer for a short term carries a much higher price than buying the computer outright. That is, cost models typically mismatch the period of the implicit contract assumed in their calculations (a long term contract over the economic life of the capital assets) with the short term (spot market) availability of network elements. (footnotes omitted)

Timothy J. Tardiff. "Costing Standards for Efficient Competition." in Michael A. Crew ed., *Expanding Competition in Regulated Industries*, Boston: Kluwer Academic Publishers, 2000, p. 180.

⁶⁵ The regulated firm subject to pure price cap regulation has ideal incentives to: (1) operate with the least-cost technology; (2) operate with no waste; (3) diversify efficiently into new markets; (4) undertake efficient levels of cost-reducing innovation; (5) report its costs truthfully; and (6) eliminate abuse. These superior incentives for efficiency derive from the fact that pure price cap regulation operates much like a *fixed-price contract*. These superior incentives may be weakened considerably under traditional rate-of-return regulation or earnings sharing regimes. See Ronald Braeutigam and John C. Panzar, "Diversification Incentives Under 'Price-Based and 'Cost-Based' Regulation. *Rand Journal of Economics*, Vol. 20, No. 3, 1989; Dennis L. Weisman, "Superior Regulatory Regimes In Theory and Practice." *Journal of Regulatory Economics*, 5, 1993, pp. 355-366; and Sappington and Weisman, *supra* note 27.

looms large here in light of the fact that the vast majority of incumbent providers in the telecommunications industry have been operating under price cap regulation in both the state and federal jurisdictions for an extended period of time. For example, in 2002, the major local exchange carriers operated under traditional rate-of-return regulation in only 8 states, whereas price cap regulation was in place in 38 states.⁶⁶ Nor is the predominance of price cap regulation a recent phenomenon. The majority of states have employed some form of incentive regulation (other than traditional, rate-of-return regulation) for more than a decade. Price cap regulation has been in place for local exchange carriers in the federal jurisdiction since 1991. Pure price cap regulation first became an option in the federal jurisdiction in 1995 and became the exclusive form of price cap regulation in mid 1997.

38. Some of the early incentive regulation plans in the telecommunications industry differed only marginally from traditional, cost-of-service regulation, so dramatic changes were not expected.⁶⁷ The evolution from price cap regulation with earnings sharing to pure price cap regulation (i.e., from a low-powered to a high powered regulatory regime) appears to have resulted in more prominent performance gains, at least with respect to certain performance dimensions. A recent NRRI publication provides a comprehensive assessment of incentive regulation in the U.S. Telecommunications industry.

The empirical research put forth to date suggests that the United States telecommunications industry has responded, for the most part, favorably to the incentives created through price-cap regulation. ... Under price-cap regulation, telephone prices have either fallen or remained the same, productivity has generally increased, modern infrastructure has been deployed at a more rapid pace, and firms have performed at least as well financially relative to the other methods of regulation available. The results for service quality are best characterized as mixed; ... In addition, the evidence so far suggests that the response has been more pronounced under pure price-cap regulation compared to hybrid plans having an earnings sharing component. This result is particularly true along the productivity and network modernization dimensions. Therefore, the existing evidence suggests that it is likely that the introduction of price-cap regulation in the United States telecommunications industry has produced benefits to consumers, producers, and regulators alike.⁶⁸

⁶⁶ David E. M. Sappington, "The Effects of Incentive Regulation on Retail Service Quality in the United States." *The Review of Network Economics*, Volume 2(4), December 2003, Table 1.

⁶⁷ David E. M. Sappington, "Price Regulation." in Martin Cave, Sumit Majumdar, and Ingo Vogelsang, eds. *Handbook of Telecommunications Economics*. North-Holland: Amsterdam, 2002, Chapter 7, pp. 225-293.

⁶⁸ Jaison R. Abel, "The Performance Of The State Telecommunications Industry Under Price-Cap Regulation: An Assessment Of The Empirical Evidence." NRRI 00-14, The National Regulatory Research Institute, September 2000, pp. 66-68.

39. One of the very first studies to rigorously examine the efficiency gains from the substitution of price cap regulation for rate-of-return regulation was commissioned by AT&T. This study concluded that AT&T realized significant productivity gains under price cap regulation relative to traditional rate-of-return. The cumulative productivity gains were estimated at approximately \$1.8 billion over three years.⁶⁹ Notably, these gains were over and above historical trends.

40. It is generally accepted that regulation should seek to emulate a competitive market outcome.⁷⁰ The Commission has duly recognized that replacing traditional rate-of-return regulation with price cap regulation would provide incentives for efficient performance that more closely approximate those of a competitive marketplace.⁷¹

In the case of LECs' interstate services, the optimal form of regulation would largely replicate the competitive outcome. ... The current LEC price cap plan represents, in large part, a program of improving consumer welfare by introducing profit incentives and price constraints that more closely replicate the operation of competition than traditional, rate-of-return regulation.⁷²

A price cap plan improves on traditional regulation by creating positive incentives for reasonable rates, innovation, productivity growth, and accurate cost allocation, while reducing regulatory burdens.⁷³

The effect is to simulate incentives similar to those in competitive markets, where higher profits are the rewards for greater efficiency and innovation, while falling profits are the penalty for inefficiency or error.⁷⁴

41. Moreover, if price cap regulation is a *de facto* admission by the regulator that it is not all-knowing and hence the regulated firm must be provided with incentives

⁶⁹ Richard Schmalensee and Jeffrey H. Rholfs, "Productivity Gains Resulting From Interstate Price Caps For AT&T." National Economic Research Associates, September 3, 1992.

⁷⁰ Professor Alfred Kahn observes that "the single most widely accepted rule for the governance of the regulated industries is regulate them in such a way as to produce the same results as would be produced by effective competition, if it were feasible." Kahn, *supra* note 35, p. 17. See also James C. Bonbright. *Principles of Public Utility Rates*. Columbia University Press: New York, 1961, chapter 6.

⁷¹ It is noteworthy that the X factor in the price cap plan for the local exchange carriers in the interstate jurisdiction has roughly doubled during the period of price cap regulation. This may well be an indication that productivity growth for local exchange carriers has been strong over the period of time that these companies have operated under price cap regulation.

⁷² Federal Communications Commission. *In the Matter of Price Cap Performance Review for Local Exchange Carriers*. First Report and Order, CC Docket No. 94-1, Released April 7, 1995, ¶ 92.

⁷³ Federal Communications Commission. *In the Matter of Price Cap Performance Review for AT&T*. Notice of Inquiry, CC Docket No. 92-134, Released July 17, 1992, ¶ 6.

⁷⁴ *Id.* at ¶ 9.

to discover how to operate efficiently, then what is the rationale for the use of hypothetical TELRIC—an approach that assumes nothing if not that the regulator is all-knowing?

In fact, the widespread adoption of price cap regulation, not only in North America, but throughout the world, is a recognition on the part of regulators that they do not have sufficient information to do what the efficient-firm approach proposes to do. It is not that the forward-looking costs for the efficient firm are unknown, they are unknowable. To paraphrase Professor Alfred Kahn, this is not like looking for a black cat in a room in which all of the lights have been turned out, there is no cat there! The extreme informational requirements of the efficient firm approach are seemingly prohibitive.⁷⁵ (footnote omitted)

42. The early economics literature on price cap regulation emphasizes two distinct yet related themes. First, the regulator is not omniscient and hence the regulated firm may well have superior information with respect to its own costs. Second, efficiency is the result of a discovery process and the regulated firm must be provided with the requisite incentives to invest in the (unobservable) effort required for such discovery. The following two quotations about price cap regulation underscore these two major themes.

The interest in price caps also reflects a growing understanding that governmental regulation is limited in what it can accomplish. The firms that are the object of regulation are almost always better informed than regulators about their costs and the consequences of adopting particular, detailed regulatory schemes for prices or conditions of service. Thus, rather than creating regulation based on the premise of an omniscient regulator being able to set optimal prices based on full knowledge of costs and demand, a more realistic regulatory goal is to design incentive mechanisms for the regulated firm that will lead it to maximize society's objectives (whether these are efficiency, distributive, or other objectives) while pursuing its self interest.⁷⁶

It [$RPI - X$] does *not* assume costs and demands are given or known; indeed, the problem is to provide adequate incentives for the company to discover them. The aim is to stimulate alertness to lower cost techniques and hitherto unmet demands. The emphasis is on productive rather than allocative efficiency (and even the $RPI - X$ price caps reflects distributional rather than allocative considerations).⁷⁷

⁷⁵ Weisman, *supra* note 17, pp. 200-201

⁷⁶ Jan Paul Acton and Ingo Vogelsang, "Introduction to the Symposium on Price Cap Regulation." *Rand Journal of Economics*, Vol. 20(3), Autumn 1989, p. 369.

⁷⁷ M.E. Beesley and S.C. Littlechild, "The Regulation of Privatized Monopolies in the United Kingdom." *Rand Journal of Economics*, Vol. 20(3), Autumn 1989, p. 467.

43. The implications of this discussion can be summarized succinctly. First, TELRIC cannot be defined or implemented in a vacuum; it must, of necessity, have objective reality, lest the Commission's use of predictive judgment with respect to forward-looking costs will degenerate into "wild speculation." Second, the current, actual costs of a firm that has been subject to price cap regulation for a prolonged period of time should be considered "presumptively efficient" and the burden should be on opposing parties to demonstrate otherwise using the facts on the ground. In other words, the incumbent providers should not bear the burden of having to disprove the wild speculation of their rivals as to the feasibility of a "field of dreams" (supra-efficient) network that exists only in their regulatory advocacy and on the pages of their legal briefs. Indeed, for the Commission to do otherwise begs a question that I dare say it cannot easily answer: Why would a regulated firm subject to price cap regulation over an extended period of time choose to be less efficient than it knows how to be? If the Commission's answer to this question is that competition will provide even stronger incentives for efficiency than price cap regulation, it may well be correct, but it is the marketplace and not the regulator that is the *final arbiter* of efficiency under the Telecommunications Act.⁷⁸ For the purposes of implementing sound measures of TELRIC, the default presumption should be that the actual costs of a firm subject to price cap regulation over an extended period of time are efficient unless it can credibly be shown otherwise. To do otherwise is to emasculate TELRIC and allow it to become simply a tool to "rig the game" (*i.e.*, competitive handicapping *du jour*) in order to justify a certain level of competitive entry.⁷⁹ The Commission has apparently already found this latter approach to be wanting.⁸⁰

44. Principle 5. What ever problems and informational asymmetries may attend the use of the incumbent provider's actual, forward-looking costs, they are far outweighed by the inherent (un)verifiability of hypothetical TELRIC. It must be

⁷⁸ The term "*final arbiter*" requires further elaboration. The regulator's charge is one of emulating a competitive market outcome and price caps is increasingly the preferred method of choice. This is not to suggest that the incumbent providers have necessarily eliminated all possible sources of inefficiency, but their incentives were clearly to have eliminated all known and discoverable sources of inefficiency. Hence, while additional efficiencies may well be found, there is no "scientific" basis for discovering them outside of the competitive market conditions that the Act seeks to foster.

⁷⁹ Indeed, there is some empirical evidence to suggest that the prices for unbundled network elements are endogenously influenced by the type of retail regulation under which the incumbent provider operates. One such study found that unbundled local loop rates are significantly lower (in excess of 3 dollars per month) in price cap states than in states that operate under some form of earnings regulation. Lehman and Weisman, *supra* note 24, chapter 7. "Pure price cap regulation is a superior regulatory regime in that it provides the incumbent firm with ideal (high-powered) incentives for cost-minimization. This suggests that, under pure price cap regulation, we should expect the firm's actual costs to be a closer approximation to the "efficient level." Dale E. Lehman and Dennis L. Weisman, "The Political Economy of Price Cap Regulation." *Review of Industrial Organization*, 16, 2000, p. 349. The fact that state decisions have been the opposite of what might have been expected suggests that the open-ended nature of hypothetical TELRIC may create opportunities for strategic behavior on the part of state regulators that works at cross-purposes with the goals of the Act.

⁸⁰ NPRM at ¶ 2 - 3.

emphasized that costs cannot be whatever rivals and (entry-seeking) regulators imagine them to be. Costs must be based in objective reality according to *Principle 3* and the incumbent provider's actual forward-looking costs should be considered "presumptively efficient" according to *Principle 4*. TELRIC measurement should not provide a means for rivals to secure a strategic advantage in the "regulatory hearing room" that they cannot secure on the merits in the marketplace.

45. The incumbent providers' actual costs can be audited and validated (or otherwise) because these costs reflect the attributes and operating characteristics of networks that actually exist in the sense that one can actually complete calls over them. Moreover, the incumbent providers supply similar services to customers that are similarly-situated according to density groups, climatic conditions and terrain. This commonality of outputs across carriers allows for a potentially meaningful comparison of "inputs"—including operating practices and network deployment. This is the "cost levels" counterpart to the "cost changes" analysis that the Commission has used in computing industry-wide X factors for price cap regulation. This ability to compare costs across carriers should serve to greatly reduce, if not eliminate, concerns about the verifiability and transparency of costing information. In reality, the opportunities for the incumbent providers to succeed in misreporting their costs are likely quite limited in practice.

46. The Commission specifically raises the issue of informational asymmetries that may result from the use of the incumbent provider's actual costs.⁸¹ There are three observations that are pertinent to this issue. First, whatever informational asymmetries may exist with the incumbent's provider's actual costs, they cannot possibly rise to a level of concern that attends the virtual complete absence of real world information (and verifiability) for hypothetical TELRIC. Second, the systematic downsizing that the incumbent providers have pursued over the last decade further mitigates, at least to some degree, concerns about informational asymmetries. This occurs because cost modelers for the incumbent provider today can and have become cost witnesses for rivals tomorrow in proceedings to determine TELRIC. Third, the asymmetric information issue came to the fore in the formal economics literature on optimal regulatory regimes.⁸² A key premise in this literature is that the regulated (incumbent) firm typically has an incentive to strategically misrepresent (overstate) its costs. This incentive to overstate costs is not necessarily present in an environment in which rivals have the option to self-provision their own networks, purchase network capacity from a third-party, or lease network elements from the incumbent provider.

47. *Principle 6. The incumbent provider's incentive to misreport its costs is not unequivocal.*⁸³ Overstating costs encourages the construction of facilities-based

⁸¹ NPRM at ¶ 23 and ¶ 58.

⁸² For an overview of this literature, see J-J Laffont, "The New Economics of Regulation Ten Years After." *Econometrica*, Vol. 62, 1994, pp. 507-537.

⁸³ This is not an affirmative statement that the incumbent providers do not overstate the cost of supplying network elements to rivals—merely an observation that it is not plainly rational for them to do so.

networks and endogenously increases the likelihood that the incumbent supplier will be forced to compete against a facilities-based provider while, at the same time, being constrained to operate with an artificially-high price floor. Understating costs discourages the construction of facilities-based networks and increases the likelihood that the incumbent provider will be forced to supply unbundled network elements to rivals at non-compensatory prices for “eternity.” This is a type of “winners curse.” It should also be noted that in the current environment of heightened vigilance with respect to corporate financial reporting (as exemplified by the enactment of the Sarbanes-Oxley Act),⁸⁴ incumbent LECs have an even greater incentive not to misstate their costs.

48. The incumbent provider also competes against facilities-based providers in other markets, such as long-distance and special access, where its incentives are purportedly to establish a relatively low price floor. Hence, there are clearly countervailing incentives. I have previously suggested that it may be informative to examine the costing methods that the incumbent providers employ in those markets in which their incentives are presumably to have low price floors and compare them with the costing methods used for unbundled network elements, after making adjustments for differences in the incremental block of output, etc. Pronounced disparities may suggest a problem with strategic costing, whereas a pattern of consistency may suggest otherwise.⁸⁵

49. Principle 7. The use of hypothetical TELRIC gives rise to a paradox in which the incumbent firm can be underpriced (foreclosed) by a less efficient rival using the incumbent firm’s own network.⁸⁶ This can occur because the incumbent provider cannot price below its actual, forward-looking costs, but the rival is able to purchase unbundled network elements at prices based on hypothetical TELRIC. This violates the *principle of competitive neutrality*—government and regulatory policies should serve to protect the integrity of the competitive process rather than protect individual competitors. This policy is the guiding principle behind the enforcement of the antitrust laws in this country and it is unclear why regulatory policies should not adopt a similar standard.

50. There may be a temptation on the part of regulators to dismiss this problem out of hand on grounds that the incumbent firm can simply be allowed to establish a price floor on the basis of hypothetical TELRIC and thereby promote competitive parity with its rivals. A moment’s reflection should convince the reader that this does not solve the problem because other, perhaps more efficient, providers of network elements may be foreclosed. In other words, the competing facilities-based provider may have costs that are lower than the incumbent provider’s actual costs, but higher than hypothetical TELRIC. The *principle of competitive neutrality* is once again violated by the use of hypothetical TELRIC.

⁸⁴ See, for example, Paul W. MacAvoy and Ira M. Millstein, *The Recurrent Crisis in Corporate Governance*. New York: Palgrave Macmillan, 2003, chapter 7.

⁸⁵ Weisman, *supra* note 17, pp. 204-205.

⁸⁶ *Id.*, pp. 207-210.

51. The perversity of hypothetical TELRIC is further underscored by the fact that, under this costing standard, a firm could credibly defend itself against a charge of predation by simply proclaiming that in another time and place in which it is more efficient than it is today its prices would cease to be below its actual costs.

In another state of the world—say one in which the entrant is a facilities-based provider—any attempt by the incumbent firm to price its services on the basis of what its incremental costs might be at some future point in time, when it may be more efficient than it is today, would be met with immediate cries of predation from the entrant, and rightfully so.⁸⁷

This, of course, begs the question as to why a costing standard that has no foundation in the law and economics literature forms the crux of this Commission's implementation of the Telecommunications Act.

52. Principle 8. Economic efficiency requires that the price for a good or service reflect the actual resource costs borne in producing that good or service. An immediate corollary to this principle is that efficiency requires that the structure of prices reflect the structure of costs. This principle, which is simply a restatement of the familiar *cost-causation principle*, requires that recurring costs be recovered in the form of usage-sensitive prices; and that non-recurring costs be recovered in the form of one-time (non-recurring) charges.⁸⁸

53. Regulatory pricing practices that deviate from this principle create economic distortions by severing the link between cost causation and cost responsibility/recovery. Furthermore, recovering non-usage sensitive costs in recurring rates can create social inequities in cost recovery. This can occur, for example, because the incumbent provider is obligated to serve as the carrier-of-last resort and is not compensated directly for provisioning the option of use, say in the form of lump-sum demand charges. As a result, regular users of the incumbent provider's network, such as residential and small business customers, may be forced to cross-subsidize new entrants and large business customers because the latter may only be using the incumbent's network on a default basis.⁸⁹ It follows that under competitive market conditions, paying

⁸⁷ *Id.*, p. 209.

⁸⁸ The Commission recognizes at ¶ 115 of the NPRM “that, as a general rule, rates for unbundled network elements should recover costs in the manner in which they are incurred.”

⁸⁹ Professor Alfred Kahn was perhaps the first to recognize this problem in the context of MCI selectively entering the market for long-distance telephone service:

It is this problem that is the most troublesome aspect of the *MCI* case and others like it. If such ventures are economically feasible only on the assumption that when they break down or become congested subscribers may simply shift over to the Bell System for the duration of the emergency, they are indeed supplying only a partial service. If the common carrier is obliged to stand ready to serve and must carry the burden of excess capacity required to meet that obligation, it would seem that its average total costs would necessarily be higher than those of a private shipper or cream-skimming competitor who has no such obligation: the latter can construct capacity merely sufficient for operation at

for the option of use in the form of usage-sensitive charges is both inefficient and socially inequitable.⁹⁰

54. Economic efficiency and competitive neutrality require that new entrants pay for the actual costs that they cause to be incurred in leasing network elements from the incumbent provider. It is a clear violation of this principle for regulators to shift the burden of financing market entry from rivals to incumbent providers and their customers. In fact, when non-recurring costs are recovered in the form of recurring or usage-sensitive charges, the incumbent provider and/or its customers may actually be subsidizing new entrants. This would seem difficult to reconcile with the requirement under the Telecommunications Act that rate structures be “just and reasonable” and “non-discriminatory.” Once again, it is critical that the Commission’s pricing rules regarding unbundled network elements not cross the line between accommodation and subsidization of competitors. Moreover, the Commission’s pricing rules should not favor new entrants over incumbent providers, nor should they favor network-element based entrants over facilities-based entrants. Subsidizing network element prices serves, of course, to disadvantage facilities-based providers. This pricing policy would seem difficult to reconcile with the Commission’s observation that “one of the central purposes of the Act” is “the promotion of facilities-based competition.”

C. Summary and Conclusions

55. The primary purpose of this discussion has been to articulate the fundamental economic principles that should be used to guide the measurement of TELRIC. These include: (1) TELRIC should not distort the rivals’ “build or buy” decision; (2) As a default standard, TELRIC should be based on a long-run, forward-looking cost standard that reflects the actual network characteristics of a “presumptively-efficient” incumbent provider; (3) Costs must have objective reality in the sense that TELRIC should comport with the facts on the ground; (4) Price cap regulation provides incentives for efficiency that more closely approximate those of a competitive marketplace; (5) Whatever potential problems, including informational asymmetries, that may attend the use of the incumbent provider’s actual, forward-looking costs, they are far outweighed by the inherent (un)verifiability of hypothetical TELRIC; (6) The incumbent provider’s incentive to misreport its costs is not unequivocal; (7) The use of hypothetical TELRIC gives rise to a paradox in which the incumbent firm can be underpriced (foreclosed) by a less efficient rival using the incumbent firm’s own network; and (8) Economic efficiency dictates that the price for a good or service reflect the actual

100 percent load factors, with the expectation that it or its customers can turn to the common carriers in the case of need. (footnotes omitted)

Alfred E. Kahn, *The Economics of Regulation*. Cambridge MA: MIT Press, Vol. 2, 1988, p. 238. Notably, this has potentially important implications for what constitutes an “efficient” fill factor in the development of TELRIC measures.

⁹⁰ Dennis L. Weisman, “Default Capacity Tariffs: Smoothing The Transitional Regulatory Asymmetries In The Telecommunications Market.” *Yale Journal on Regulation*, Vol. 5(1), Winter 1988, pp. 149-178.

resource costs borne in producing that good or service, and that the structure of prices reflect the structure of costs.

56. In addition to the above-stated principles, the goals articulated by the Congress in the preamble of the Telecommunications Act provide additional guidance for the proper measurement of TELRIC. Specifically, the Congress directed this Commission to implement the Telecommunications Act so as to “to promote competition and reduce regulation” and thereby place increased reliance on market forces. This means that rivals should have the correct incentives to invest in facilities-based networks when and where it is efficient for them to do so. This necessarily implies a long-run (rather than a short-run) costing standard that reflects the actual network characteristics of a “presumptively-efficient” incumbent provider. To proceed otherwise is to proceed “unscientifically” and in so doing blur the critical distinction between “mandating the competitive outcome” and “fostering the competitive process.”

57. As a first approximation, the TELRIC measure should not be based on the performance of an “ideally-efficient firm,” but rather on the actual performance of the incumbent provider. In turn, the actual, forward-looking costs of an incumbent provider that has operated under price cap regulation (or some other “high-powered” regulatory regime) for an extended period of time should be considered “presumptively efficient” and the burden should be on opposing parties to demonstrate otherwise using real world evidence. Even if current costs are not used to set prices for unbundled network elements, these cost measures nonetheless contain potentially useful information that can serve to validate the reasonableness of TELRIC measures. In this respect, it is important to recognize that the Congress intended that the marketplace not the regulator serve as the *final arbiter* of efficiency under the Telecommunications Act.

58. The TELRIC measurement exercise should be conducted in a manner that elicits “good-faith” estimates of the actual, forward-looking costs that the incumbent provider incurs in supplying network elements to rivals. The measurement of TELRIC should not provide an opportunity for either the incumbent provider or its rivals to secure a strategic advantage in the “regulatory hearing room” that it cannot secure on the merits in the marketplace. It necessarily follows that the measurement of TELRIC should remain vigilant in maintaining the critical distinction between “predictive judgment” and “wild speculation.”

59. Setting prices for unbundled network elements on the basis of hypothetical TELRIC is not good for consumers and hence not good public policy. In the longer run, such policies will lead to disinvestment in the industry and retard the development of new telecommunications technologies. There is, of course, a strong temptation on the part of state regulators—to which some have succumbed—to impose artificially-low prices for unbundled network elements today and leave it to their successors to worry about the adverse effects on infrastructure investment tomorrow. The facts, quite simply, are that some state commissions have not been very good stewards of the responsibilities they have been given to implement the various provisions of the Telecommunications Act in a

fair and principled manner.⁹¹ It is therefore incumbent upon this Commission to impose upon state regulators the discipline that some have been incapable thus far of imposing upon themselves. Nothing less than the realization of the goals of the Telecommunications Act hangs in the balance.

60. The economic principles set forth in this discussion are largely theoretical in nature. Consequently, the application of these principles to real-world data will present the need to temper theory with practice. And yet, these principles in concert with the preamble of the Act itself should serve to guide the development of TELRIC measures that are consistent with the type of competition that the Congress envisioned when it passed the Telecommunications Act. This means that there should be less emphasis placed on counting the absolute number of competitors in any given market and more emphasis placed on encouraging the entry of efficient competitors that will ultimately allow for the sunset of regulation in local telephone service markets in the United States.⁹² Then and only then will the regulatory rules that are crafted to implement the letter of the Act also be true to the spirit of the Act.

⁹¹ See the Comments of Qwest Communications International in response to the Notice of Proposed Rulemaking, In the Matter of *Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, WC Docket No. 03-173, December 16, 2003.

⁹² It is conceivable, of course, that too many competitors actually means too little competition. This speaks to the wisdom, or lack thereof, inherent in using the model of perfect competition to inform the design of the Commission's rules for implementing the Telecommunications Act. See, for example, Weisman, *supra* note 17, pp. 202-203; and Kahn et. al, *supra* note 31, pp. 348-349.

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Statement in Support of Senate Bill 606 Before The Commerce Committee of the Kansas State Legislature. Subject Matter: Broadband Deployment and Relaxed Regulatory Oversight of Local Exchange Carriers, February 26, 2002.

TESTIMONY AND AFFIDAVITS (CONTINUED):

Testimony before The Canadian Radio-Television and Telecommunications Commission In Response To Telecom Public Notice CRTC 2001-37 On Behalf of TELUS Communications, Inc. Subject Matter: Price Cap Regulation and Accommodative Competitive Entry Policies, October, 2001.

Testimony before The Colorado Public Utilities Commission In Docket Number 00A-201T

On Behalf of Qwest Communications. Subject Matter: Removal of Imputation Requirements In IntraLATA Toll Markets, October 2000.

Testimony before The Kansas Corporation Commission in Docket Number 98-SWBT-431-DRS On Behalf of Southwestern Bell Telephone Company. Subject Matter: Depreciation and Price Cap Regulation, February 1999.

Testimony before The Texas Public Utilities Commission In Docket Numbers 16189, 16196, 16226, 16285, 16290, 16455, 17579, 17587, and 17781 On Behalf of Southwestern Bell Telephone Company. Subject Matter: Local Competition and Pricing of Unbundled Network Elements, September 1997.

Affidavit Filed With The Kansas Corporation Commission In Docket No. 197-SWBT-440-IAT On Behalf of Southwestern Bell Telephone Company. Subject Matter: The Anti-Competitive Implications Of Selective Pass-Through of The Kansas Universal Service Fund Assessment. June 12, 1997.

Affidavit Filed With The Federal Communications Commission On Behalf of SBC Communications Inc. For Provision Of In-Region, InterLATA Services In Oklahoma (With David S. Sibley). Subject Matter: Incentives For Anti-Competitive Behavior, CC Docket No. 97-121, May 27, 1997.

Testimony before The Arkansas Public Service Commission In Docket Number 96-395-U On Behalf of Southwestern Bell Telephone Company. Subject Matter: Local Competition and Pricing of Unbundled Network Elements, January 1997.

Testimony before The Kansas Corporation Commission In Docket Number 97-AT&T-290-ARB On Behalf of Southwestern Bell Telephone Company. Subject Matter: Local Competition and Pricing of Unbundled Network Elements, January 1997.

Testimony before The Kansas Corporation Commission in Docket Number 190-492-U On Behalf of Southwestern Bell Telephone Company. Subject Matter: Price Cap Regulation and Economically Efficient Imputation Policies, August 1996.

TESTIMONY AND AFFIDAVITS (CONTINUED):

Testimony before The Canadian Radio-Television and Telecommunications Commission In Response To Telecom Public Notice CRTC 96-8 On Behalf of TELUS Communications, Inc. Subject Matter: Price Cap Regulation and Related Issues, October 1996.

Affidavit filed with the Kansas Corporation Commission In Docket No. 96-SWBT-356-TAR On Behalf of Southwestern Bell Telephone Company. Subject Matter: The Economic and Competitive Implications of Mandatory Disclosure of Proprietary Cost and Demand

Information. April 12, 1996.

Testimony before the Missouri Public Service Commission in Case Number TO-86-53 On Behalf of Southwestern Bell Telephone Company. Subject matter: Shared Tenant Services and Residual Regulatory Obligations in the Telecommunications Industry, July 1987.

Testimony before the Kansas Corporation Commission in Docket No. 127,140-U On Behalf of Southwestern Bell Telephone Company. Subject matter: Bypass and Competition in the Telecommunications Industry, September 1986.

Testimony before the Missouri Public Service Commission in Case Number TR-86-84 On Behalf of Southwestern Bell Telephone Company. Subject matter: Bypass and Competition in the Telecommunications Industry, February 1986.

Testimony before the Texas Public Utilities Commission in Docket Number 6200 On Behalf of Southwestern Bell Telephone Company. Subject matter: Bypass and Competition in the Telecommunications Industry, November 1985.

Testimony before the Arkansas Public Service Commission in Docket Number 83-042-U On Behalf of Southwestern Bell Telephone Company. Subject matter: Bypass and Competition in the Telecommunications Industry, September 1985.

INVITED PRESENTATIONS:

“Regulatory Moral Hazard: Price Caps and Endogenous Entry Under the 1996 Telecommunications Act.” Competitive Entry In Regulated Industries. Center For Research In Regulated Industries, Rutgers University, Newark, New Jersey, May 2000.

“The Telecommunications Act of 1996: The ‘Costs’ of Managed Competition.” American Enterprise Institute, Washington D.C., September 1999 (with D. Lehman).

INVITED PRESENTATIONS (CONTINUED):

“Vertical Integration and Exclusionary Behavior in Network Industries.” The Rutgers University 12th Annual Western Conference of the Advanced Workshop In Regulation and Competition, San Diego, California, July 1999.

“The Political Economy of Price Cap Regulation.” The Rutgers University 11th Annual Western Conference of the Advanced Workshop In Regulation and Competition, Monterey, California, July 1998.

“Regulation and Common Costs: Estimation versus Allocation – A Discussion.” Pricing and Costing A Competitive Local Telecommunications Network. American Enterprise Institute, Washington D.C., November 1997.

“Does Tighter Price Cap Regulation Increase Consumer Welfare?” The Rutgers University 10th Annual Western Conference of the Advanced Workshop In Regulation and Public Utility Economics, San Diego, California, July 1997.

“Competition, Incentive Regulation, and Strategic Behavior Under The 1996 Telecommunications Act.” Utility Regulation And Strategy: The Basics Revisited. Conference sponsored by the Public Utility Research Center at the University of Florida, Gainesville, Florida, February 1997.

“Competitive Incentives of Vertically Integrated Local Exchange Carriers.” Twenty-Third Annual Telecommunications Policy Research Conference. Solomons, Maryland, October 1995; and The Rutgers University 9th Annual Western Conference of the Advanced Workshop In Regulation and Public Utility Economics, San Diego, California, July 1996.

“Seven Myths About Incentive Regulation.” Pricing and Regulatory Innovations Under Increasing Competition. Conference sponsored by the Center for Research in Regulated Industries, Rutgers University, Newark, New Jersey, October 1995.

“Strategic Behavior of the Vertically Integrated Firm: The Case of RBOC Entry Into InterLATA Long Distance.” The Rutgers University 8th Annual Western Conference of the Advanced Workshop In Regulation and Public Utility Economics, San Diego, California, July 1995.

“The Promise and Pitfalls of Incentive Regulation.” Market and Technological Convergence: Implications For Regulation. Conference sponsored by the Public Utility Research Center at the University of Florida, Gainesville, Florida, April 1995.

INVITED PRESENTATIONS (CONTINUED):

“Potential Pitfalls in Empirical Investigations of the Effects of Incentive Regulation Plans in The Telecommunications Industry.” Telecommunications Infrastructure and the Information Economy: Interaction Between Public Policy and Corporate Strategy. Conference sponsored by the School of Business at the University of Michigan, Ann Arbor, Michigan, March 1995.

“Designing Incentive Regulation For The Telecommunications Industry.” American Enterprise Institute, Washington D.C., March 1995 (with D. Sappington).

British Broadcasting Corporation (BBC) Radio Interview with Dan Corry of the Institute For Public Policy Research, London, England. Documentary. “Analysis: The Regulatory State?”

October 23, 1994.

“Designing Carrier of Last Resort Obligations.” The Rutgers University 7th Annual Western Conference of the Advanced Workshop in Regulation and Public Utility Economics, San Diego, California, July 1994.

“Incentive Regulation: Lessons From Telecommunications.” Innovative Incentive Rate Regulation for a Competitive Electric Utility Industry. Conference co-sponsored by the Center for Regulatory Studies and the Institute of Government and Public Affairs. Chicago, Illinois, April 1994.

“Why Less May Be More Under Price Cap Regulation.” Twenty-First Annual Telecommunications Policy Research Conference. Solomons, Maryland, October 1993; and The Rutgers University 12th Annual Eastern Conference of the Advanced Workshop in Regulation and Public Utility Economics, Brewster, Cape Cod, Massachusetts, May 1993.

“Managed Competition In Telecommunications.” Regulation and Planning In A Market Economy. Conference sponsored by the Public Utility Research Center, University of Florida. Gainesville, Florida, April 1993.

“Cross-Subsidization and Price Predation in Public Enterprise;” and “Incentive Regulation: Theory and Practice.” Southeastern Regional Business and Economics Utilities Conference, Atlanta, Georgia, September 1991.

“Post-Divestiture Pricing Trends In The Telecommunications Industry.” Divestiture: Five Years Later. Conference sponsored by the Center for Telecommunications and Information Studies at Columbia University, Washington, D.C., March 1989.

“The Impact of Telecommunications Regulation On The Economic Incentives of Private Network Deployment.” National Communications Forum, Chicago, Illinois, October 1988.

INVITED PRESENTATIONS (CONTINUED):

“Protecting The Right To Be Served By Regulated Utilities Subject To Competition: A Critical Assessment.” 11th World Engineering Congress, Atlanta, Georgia, October 1988.

“Default Capacity Tariffs: Smoothing The Transitional Regulatory Asymmetries In The Telecommunications Marketplace.” Fifteenth Annual Telecommunications Policy Research Conference, Airlie, Virginia, November 1987.

“Traffic Sensitive Costs, Bypass and Pricing For Carrier of Last Resort.” Bell Communications Research Conference on Traffic Sensitive Cost Recovery. Seattle, Washington, July 1986.

“Forecasting Bypass Adoption In Telecommunications.” National Forecasting Conference,

Denver, Colorado, June 1985.

“A General Theory of Point-to-Point Long Distance Demand.” Bell Communications Research Business Research Conference, Durango, Colorado, October 1984.

HONORS, AWARDS, AND GRANTS:

2001	Edgar S. Bagley Research Award
1999 – 2000	American Enterprise Institute Grant (Co-Principal Investigator)
1996	William L. Stamey Teaching Award
1995	Edgar S. Bagley Research Award
1993	First-Place In Graduate Student Paper Competition, Twenty-First Annual Telecommunications Policy Research Conference
1990 – 1993	Florida Public Service Commission Grant to the Public Utility Research Center at the University of Florida (Co-Principal Investigator)
1984 – 1993	Designated Very High Potential Manager, SBC Communications
1991	First-Place In Paper Competition sponsored by Public Utilities Reports, Inc., Southeastern Business and Economics Utilities Conference (with S. Berg)
1991	University of Florida Research Fellowship

HONORS, AWARDS, AND GRANTS (CONTINUED):

1989	Management Stock Award, Southwestern Bell Corporation
1979	B.A. Conferred with High Honors
1971	Eagle Scout Award

EDITORIAL BOARDS:

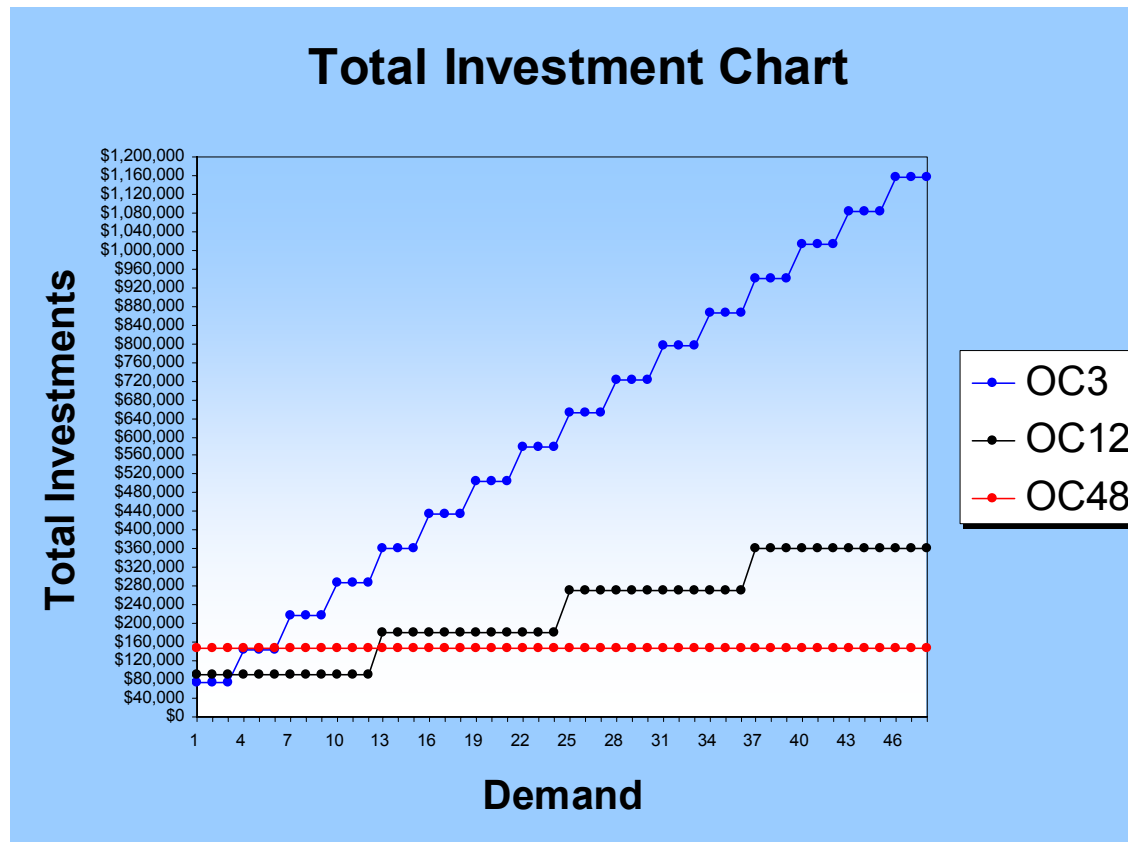
2003 – Present	The Review of Network Economics
1997 – Present	Journal of Regulatory Economics
1996 – Present	Information Economics and Policy

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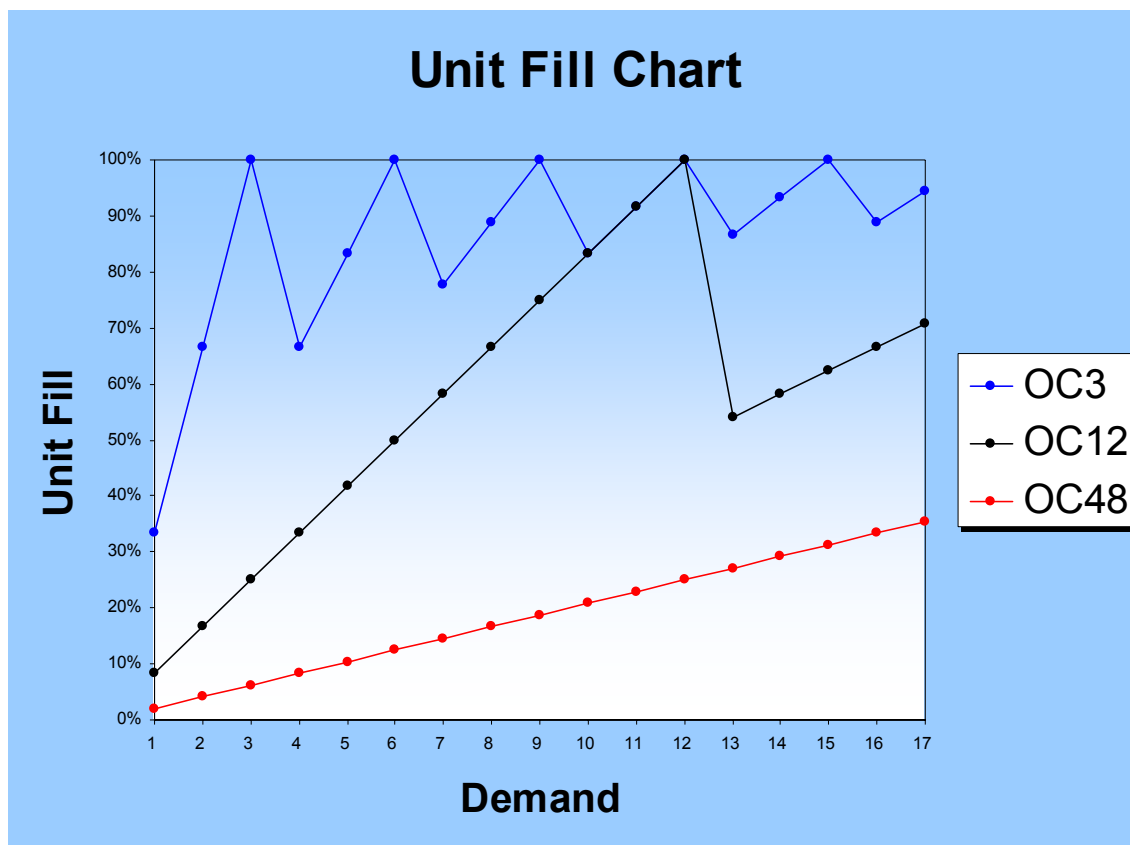
American Economic Review
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Eastern Economic Journal
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Organization
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Telecommunications Systems
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The Journal of Law, Economics, &
Organization
The Review of Economics and Statistics
The Review of Network Economics

Incremental Investment by System Size and Demand



Incremental Fill by System Size and Demand



Comparison of Investment Per Line to Expense Per Line
Correlation Analysis

TOTAL OPERATING EXPENSE LESS DEPRECIATION AND ACCESS (\$000's)

Row 1190 less Rows 1170 and 1180 of ARMIS 43-01 Rpt.

	1996	1997	1998	1999	2000	2001	2002
Qwest Communications	4,968,297	5,091,731	5,194,263	5,207,829	5,590,812	5,051,365	
Bell South Corporation	6,980,055	6,820,980	6,788,899	6,775,528	6,571,937	7,279,006	7,644,026
SBC Communications	15,805,058	17,395,320	16,852,060	17,543,520	18,130,312	17,126,441	18,409,879
Verizon Communications	20,155,596	19,745,164	20,030,491	18,675,975	18,081,668	18,492,358	18,287,438
Alltel Corporation	289,726	306,441	359,402	379,777	378,060	365,981	349,006
Cincinnati Bell Telephone	371,391	369,148	410,155	375,537	348,248	368,968	364,861
Citizens Communications, Inc.	269,267	273,826	251,648	267,896	296,244	297,689	260,507
Sprint Local Telecommunications	1,739,236	2,409,648	2,597,659	2,762,930	2,528,165	2,526,888	2,550,180
Commonwealth Telephone				63,287	66,162	66,299	67,222

TOTAL PLANT IN SERVICE (TPIS) (\$000'S)

Row 1690 of ARMIS 43-01 Rpt.

	1996	1997	1998	1999	2000	2001	2002
Qwest Communications	31,631,210	32,355,537	33,653,422	35,309,207	38,555,716	41,736,119	
Bell South Corporation	45,318,200	47,203,291	49,517,269	51,851,044	55,795,408	59,722,344	61,559,716
SBC Communications	89,274,985	93,526,289	97,760,843	102,174,816	108,483,164	115,957,361	120,208,818
Verizon Communications	108,266,964	112,921,574	119,240,531	125,282,112	129,688,285	137,833,863	139,137,715
Alltel Corporation	1,946,655	2,047,501	2,491,201	2,596,372	2,734,207	2,877,373	3,037,909
Cincinnati Bell Telephone	1,546,238	1,650,494	1,753,101	1,865,083	1,944,188	2,058,291	2,110,296
Citizens Communications, Inc.	1,480,249	1,501,207	1,581,344	1,674,843	1,744,171	1,852,662	2,356,491
Sprint Local Telecommunications	8,015,958	12,032,310	13,360,203	14,254,140	15,207,046	16,044,740	16,649,509
Commonwealth Telephone				507,504	535,906	577,434	605,494

TOTAL SWITCHED ACCESS LINES

ARMIS 43-08 Rpt. Table III

	1996	1997	1998	1999	2000	2001	2002
Qwest Communications	15,286,521	16,132,694	16,859,395	17,448,690	17,626,160	16,664,145	15,682,208
Bell South Corporation	21,707,307	22,819,623	24,043,571	24,906,568	25,087,026	24,088,143	22,300,335
SBC Communications	52,561,752	55,061,831	57,328,042	58,425,815	58,041,420	53,857,591	51,114,103
Verizon Communications	56,221,634	59,169,522	61,089,765	63,813,831	63,015,957	61,581,111	58,028,209
Alltel Corporation	944,401	998,988	1,254,652	1,253,098	1,295,879	1,288,726	1,267,974
Cincinnati Bell Telephone	943,609	1,004,829	1,032,640	1,039,059	1,032,518	1,015,510	994,307
Citizens Communications, Inc.	813,605	851,621	879,292	887,921	901,234	880,881	865,155
Sprint Local Telecommunications	4,434,392	6,587,205	7,103,197	7,445,081	7,733,823	7,637,686	7,507,869
Commonwealth Telephone				292,455	311,458	326,118	333,187

Comparison of Investment Per Line to Expense Per Line
Correlation Analysis

TOTAL ADJ. OPERATING EXPENSE PER LINE

	1996	1997	1998	1999	2000	2001	2002
Qwest Communications	325.01	315.62	308.09	298.47	317.19	303.13	
Bell South Corporation	321.55	298.91	282.36	272.04	261.97	302.18	342.78
SBC Communications	300.70	315.92	293.96	300.27	312.37	317.99	360.17
Verizon Communications	358.50	333.70	327.89	292.66	286.94	300.29	315.15
Alltel Corporation	306.78	306.75	286.46	303.07	291.74	283.99	275.25
Cincinnati Bell Telephone	393.59	367.37	397.19	361.42	337.28	363.33	366.95
Citizens Communications, Inc.	330.96	321.54	286.19	301.71	328.71	337.94	301.11
Sprint Local Telecommunications	392.22	365.81	365.70	371.11	326.90	330.84	339.67
Commonwealth Telephone				216.40	212.43	203.30	201.75

TOTAL PLANT IN SERVICE (TPIS) INVESTMENT PER LINE

	1996	1997	1998	1999	2000	2001	2002
Qwest Communications	2069.22	2005.59	1996.12	2023.60	2187.41	2504.55	
Bell South Corporation	2087.69	2068.54	2059.48	2081.82	2224.07	2479.33	2760.48
SBC Communications	1698.48	1698.57	1705.29	1748.80	1869.06	2153.04	2351.77
Verizon Communications	1925.72	1908.44	1951.89	1963.24	2058.02	2238.25	2397.76
Alltel Corporation	2061.26	2049.58	1985.57	2071.96	2109.92	2232.73	2395.88
Cincinnati Bell Telephone	1638.64	1642.56	1697.69	1794.97	1882.96	2026.85	2122.38
Citizens Communications, Inc.	1819.37	1762.76	1798.43	1886.25	1935.31	2103.19	2723.78
Sprint Local Telecommunications	1807.68	1826.62	1880.87	1914.57	1966.30	2100.73	2217.61
Commonwealth Telephone				1735.32	1720.64	1770.63	1817.28

CORRELATION ANALYSIS

	Correlation Coefficients R	Coefficient of Determination R Squared
<u>By Year All Companies</u>		
Year 1996	-0.472128284	0.222905117
Year 1997	-0.642004998	0.412170418
Year 1998	-0.435716766	0.189849100
Year 1999	0.058671055	0.003442293
Year 2000	0.165334528	0.027335506
Year 2001	0.308376912	0.095096320
Year 2002	0.423435417	0.179297553

CERTIFICATE OF SERVICE

I, Richard Grozier, do hereby certify that I have caused the foregoing **COMMENTS OF QWEST COMMUNICATIONS INTERNATIONAL INC.** to be 1) filed with the FCC via the Electronic Comment Filing System, and 2) served via e-mail on the FCC's duplicating contractor Qualex International, Inc. (qualexint@aol.com) and Ms. Tamara Preiss (tamara.preiss@fcc.gov) of the FCC's Pricing Policy Division.

/s/ Richard Grozier
Richard Grozier

December 16, 2003